Fig. 1

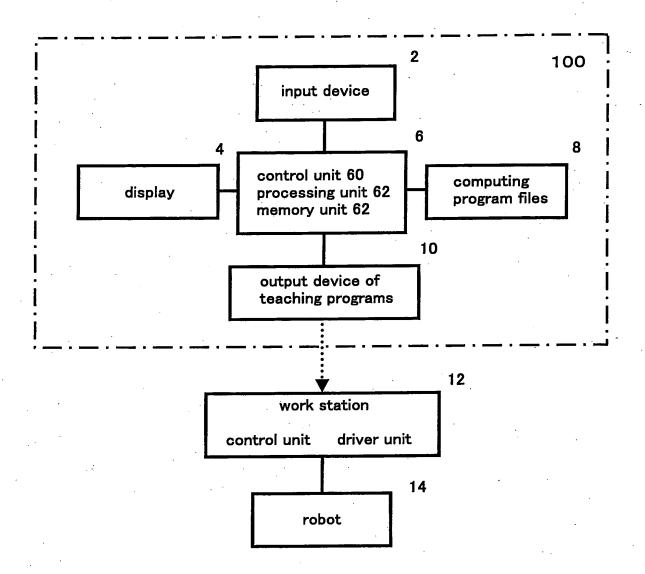
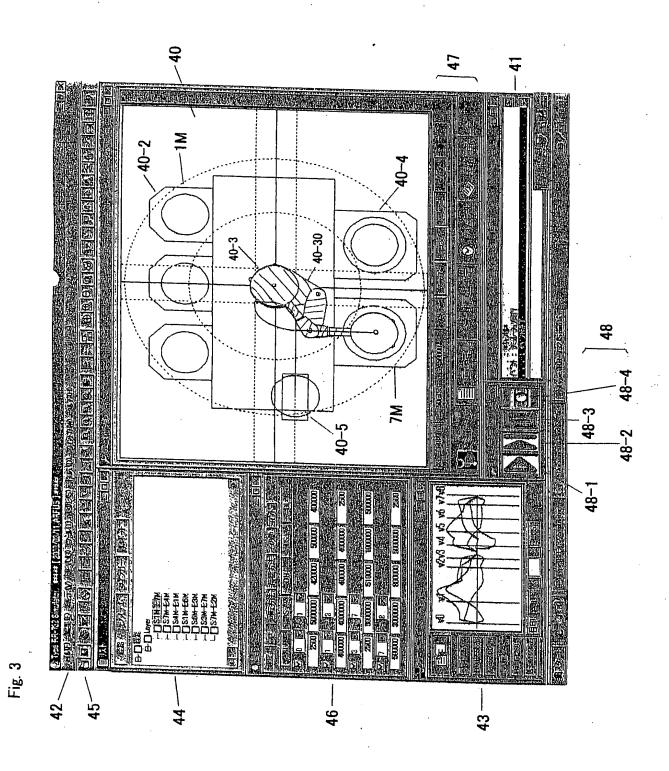


Fig. 2

display 4

simulation windows
message windows
location & speed windows
lists windows
menu bars
tool bars
hop-up menu
start & stop buttons
graph windows



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display coordinates
display a robot (shape & location)
display a finger (shape & location)
display time
route generation & route modification
obstacles region generation,
and modification
screen expanding, shrinking,
and shifting
coordinate axes (X, Y, Z) shifting
rotation & copy
distance between vertexes
data input
inversion input

Fig. 5

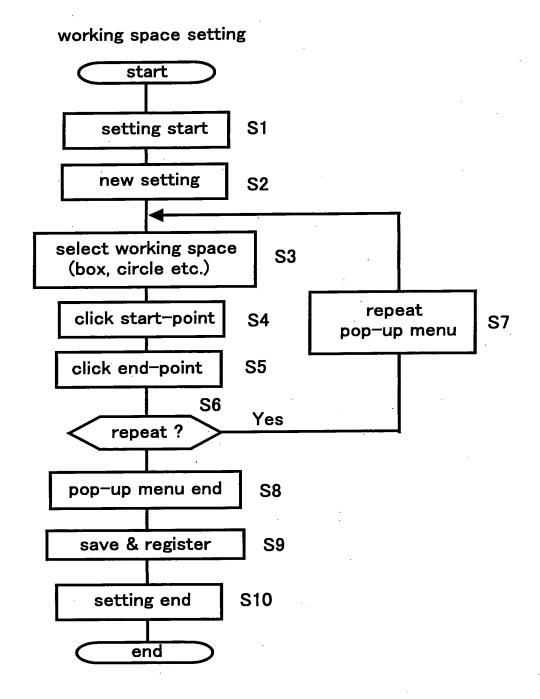


Fig. 6

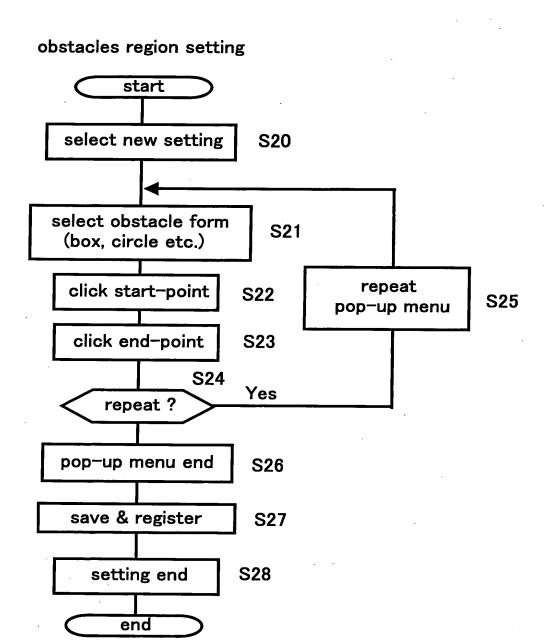


Fig. 7

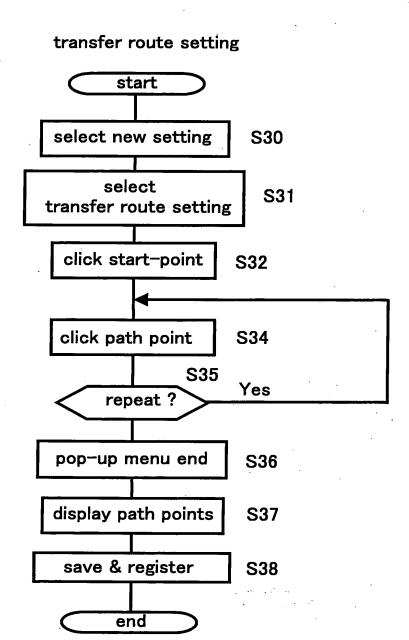


Fig. 8

simulation of robot's movement

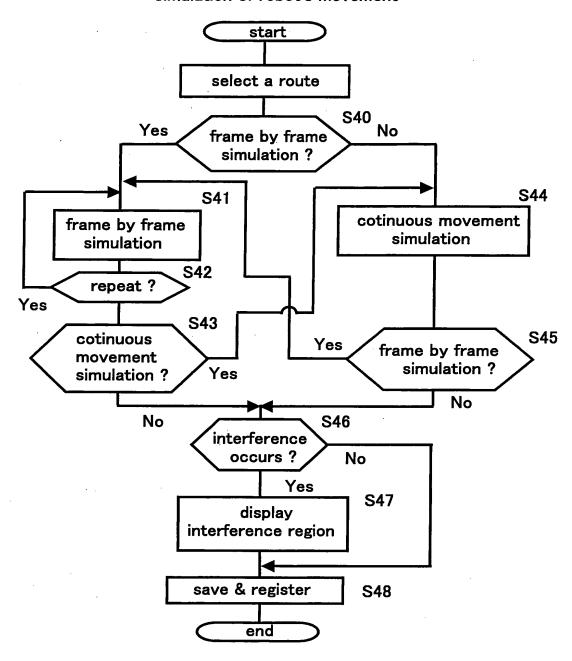


Fig. 9

regions, routes and robot information are generated by a simulator

send route information (commands) to a robbot all route information (command 1 - 3) are generated by the simulation

command 1

generates and sends coordinates of path points and data of circular arcs connecting the path points

(X, Y): coordinates axes of absolute positions a plurality of coordinate axes of the path points

(r): radius of a circular arc, when path points are rounded by the circular arc

command 2

generates and sends speed data of a wafer transferring

AL: speed at startup acceleration

AS: acceleration at accelerating speed

OH: maximum speed

DS: acceleration at decelerating speed

DL: speed at end decelerating

command 3

generates and sends rotating information of a end effector (finger)

a plurality of rotating zones rotating angle (radian)

save & register

command data of all routes are sent to a control unit of a robot

in case 4-axes control is adopted, 4 control units are connected and command data for each control unit are specified